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Proposed Remedial Action Plan

for

Operable Unit 2

Marine Corps Air Station

Cherry Point, North Carolina

Atlantic Division

Naval Facilities Engineering Command

Contract Number N62472-90-D-1298

Contract Task Order 0211

June 1996

Brown & Root Environmental

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PROPOSED REMEDIAL ACTION PLAN
FOR
OPERABLE UNIT 2

MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
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Environmental Restoration Branch, Code 1823
Naval Facilities Engineering Command
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CONTRACT NUMBER N62472-90-D-1298
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JUNE 1996

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
AS/SVE	Air Sparging/Soil Vapor Extraction
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
COPC	Chemical of Potential Concern
DCE	Dichloroethene
DERA	Defense Environmental Restoration Account
DOD	Department of Defense
DON	Department of the Navy
FS	Feasibility Study
GWQ	Groundwater Quality
HI	Hazard Index
HQ	Hazard Quotient
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
ICR	incremental cancer risk
IM	Interim Measure
IRP	Installation Restoration Program
L	Liter
mg	Milligrams
MGD	Million Gallons per Day
MCAS	Marine Corps Air Station
NACIP	Department of the Navy Assessment and Control of Installation Pollutants
Navy	Department of the Navy
NCDEHNR	North Carolina Department of Environment, Health, and Natural Resources
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NPW	Net Present Worth
O&M	Operation and Maintenance

OU	Operable Unit
PA	Preliminary Assessment
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
POL	Petroleum, Oil, and Lubricant
PRAP	Proposed Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RGO	Remedial Goal Option
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SI	Site Inspection
STP	Sewage Treatment Plant
SWMU	Solid Waste Management Unit
TBC	To Be Considered
TCE	Trichloroethene
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

PROPOSED REMEDIAL ACTION PLAN

Introduction

This Proposed Remedial Action Plan (PRAP) identifies the Marine Corps Air Station (MCAS) Cherry Point and the Department of the Navy's (DON) preferred alternative for the remediation of contaminated soil and groundwater at Operable Unit (OU) 2 at MCAS Cherry Point, North Carolina. Investigation of OU2 was conducted as required by the Resource Conservation and Recovery Act (RCRA) Administrative Order on Consent. OU2 consists of Site 10 - Old Sanitary Landfill; Site 44A - Former Sludge Application Area (RCRA Sludge); Site 46 - Polishing Ponds No. 1 and No. 2; and Site 76 - Vehicle Maintenance Area (Hobby Shop).

The purpose of this PRAP is to:

- describe the remedial alternatives considered
- identify the preferred alternative for OU2 and explain the rationale for the preference
- solicit public review and comments on the remedial alternatives
- provide information on how the public can be involved in the remedial action selection process

MCAS Cherry Point and DON are issuing this PRAP as part of the public participation responsibility established under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

The PRAP summarizes information that can be found in greater detail in the Remedial Investigation (RI) Report, the Feasibility Study (FS) Report, and other documents referenced in these reports. The Navy encourages the public to review these other documents to gain a more comprehensive understanding of the sites. The administrative record file, which contains information on which the selection of the remedial alternative will be based, is available for public review at the Havelock Public Library and the MCAS Cherry Point Library. The public is invited to review and comment on the administrative record and the PRAP.

After the public comment period has ended and the information has been reviewed and considered, MCAS Cherry Point and DON, with assistance of USEPA Region IV and the NCDEHNR, will select a remedial alternative for OU2. The Final Record of Decision (ROD) may recommend a different remedial action than is presented in this plan, depending upon new information or public comments.

Operable Unit Description

MCAS Cherry Point is a military installation for the United States Marine Corps located north of the town of Havelock in southeastern Craven County, North Carolina. The Air Station covers approximately 11,485 acres. Its boundaries are the Neuse River to the north, Hancock Creek to the east, North Carolina Highway 101 to the south, and a boundary line approximately three-fourths mile west of Slocum Creek. The entire facility is situated on a peninsula north of Core and Bogue Sounds and south of the Neuse River. The location of the Air Station is shown on Figure 1. A map identifying the general location of OU2 at MCAS Cherry Point is provided in Figure 2.

The study area, OU2, is one of 13 operable units within MCAS Cherry Point. An "operable unit," as defined by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), is a discrete action that comprises an incremental step toward comprehensively addressing site problems. The cleanup of a site or facility can be divided into a number of operable units, depending on the complexity of the problems associated with the facility. Operable units may address geographic portions of a site, specific site problems, or initial phases of an action. With respect to MCAS Cherry Point, operable units were developed to combine one or more individual sites where Installation Restoration Program (IRP) activities are or will be implemented. In the case of OU2, Sites 10, 44A, 46, and 76 were grouped together because of their geographic proximity.

- Site 10 - Old Sanitary Landfill
- Site 44A - Former Sludge Application Area (RCRA Sludge)
- Site 46 - Polishing Ponds No. 1 and No. 2
- Site 76 - Vehicle Maintenance Area (Hobby Shop)

Operable Unit 2 is located in the west/central portion of the Air Station, as shown on Figure 2. It is bounded by the MCAS, Cherry Point Sewage Treatment Plant (STP) to the north, Roosevelt Boulevard to the east, a residential area to the south, and Slocum Creek to the west (Figure 3). OU2 consists primarily of Site 10. It also includes Site 46 north of the landfill, Site 44A, formerly Site 45, located in the north-central portion of OU2, and Site 76 located southwest of the landfill.

Operable Unit Background

The OU2 sites have been grouped into one operable unit because of their proximity to each other (i.e., Site 44A overlies portions of Site 10, and Site 46 and Site 76 are located adjacent to the landfill). In addition,

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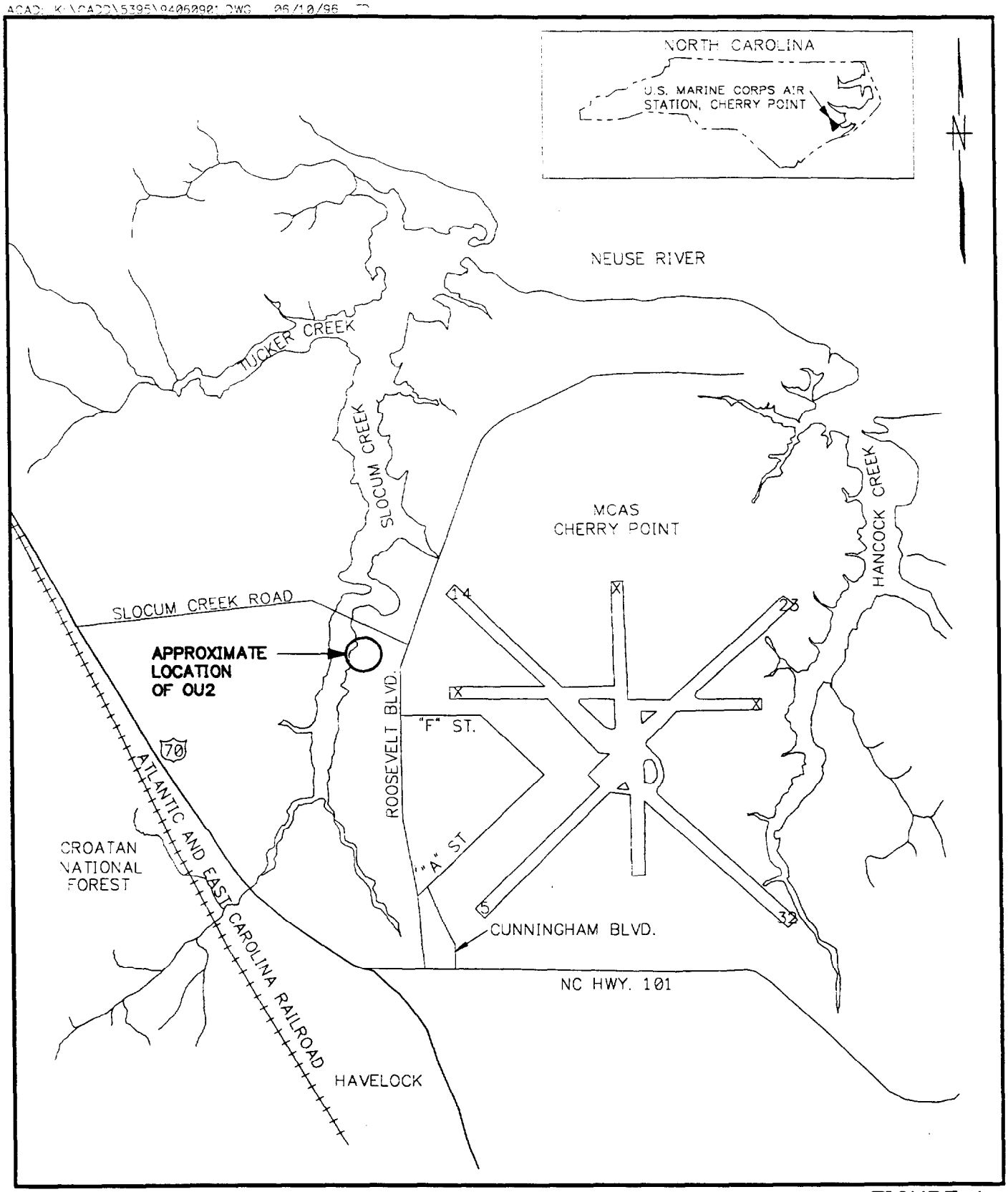

FIGURE 1

LOCATION MAP
MCAS CHERRY POINT, NORTH CAROLINA

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SCALE IN FEET

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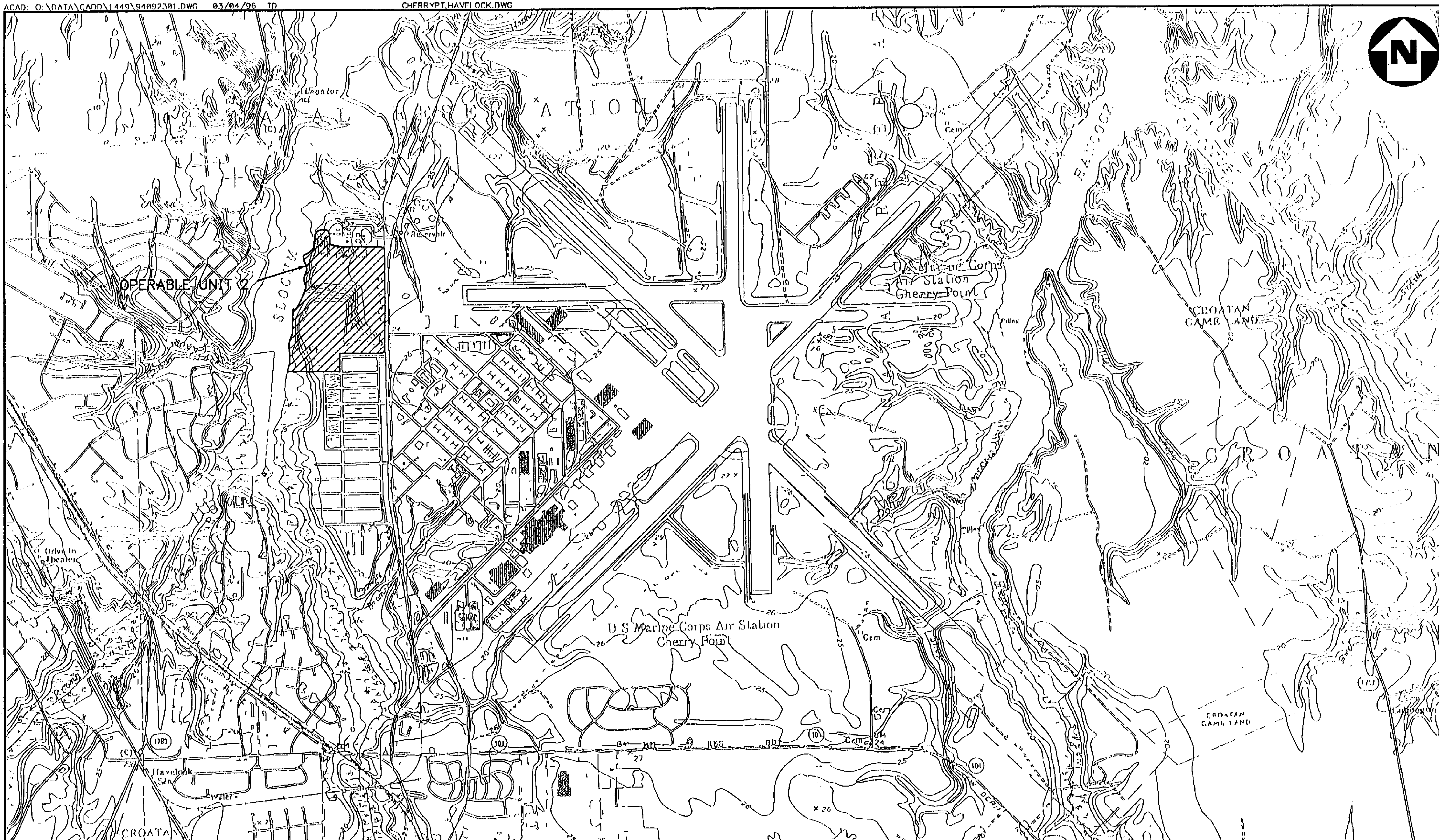

FIGURE 2

OPERABLE UNIT 2
GENERAL AIR STATION MAP
MCAS CHERRY POINT, NORTH CAROLINA

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ROOSEVELT ROAD
SITE 10-OLD SANITARY LANDFILL
APPROXIMATE LOCATION OF FENCE
GENERAL AREA OF OPERABLE UNIT 2
SITE 43 SEWAGE TREATMENT PLANT
DRUMMED PETROLEUM (ABANDONED)
STORAGE
FORMER SLUDGE IMPOUNDMENT AREA
SITE 44A FORMER SLUDGE APPLICATION AREA
TURKEY GUT
SITE 46 POLISHING POND 2
SITE 46 POLISHING POND 1
GRASSY DRAINAGE SWALE
POSSIBLE FILLED TRENCHES
POSSIBLE TRENCHES/ RUBBLE AREAS
POSSIBLE RUBBLE AREAS
FORMER LOCATION OF PLANES WITH CHARRED AREAS
WASH RACK
MWR STORAGE AREA
AUTO HOBBY SHOP
SITE 76 VEHICLE MAINTENANCE AREA (HOBBY SHOP)
SLOCUM CREEK

REVISIONS

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ACTIVITY - SATISFACTORY TO

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NORFOLK, VIRGINIA
NAVAL STATION
MARINE CORPS AIR STATION CHERRY POINT
CHERRY POINT, NORTH CAROLINA
OU2
GENERAL SITE LOCATION MAP

CODE ID NO. 80091 SIZE D
SCALE AS SHOWN
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SPEC. NO.
CONTR. GOVT NO. XX-XX-XXXX
DRAWING NO. XXXXXX-XX-X-XXXX
SHEET X OF X

FIGURE 3

Site 44A and Site 46 both contain the same types of suggested contamination derived from sewage treatment.

Site 10 - Old Sanitary Landfill

Site 10 is located west of Roosevelt Boulevard and south of Site 43 (Sewage Treatment Plant), on the east side of Slocum Creek. The site consists of a sanitary landfill approximately 40 acres in size, which had served as the primary disposal site at MCAS Cherry Point from 1955 until the early to mid-1980s. Contaminated material and petroleum, oil, and lubricants (POLs) were landspread, burned, stored in unlined pits, and buried at the landfill. Former sludge impoundments that were closed in the mid-1980s, are also located at this site. The impoundments were used to dispose of metal filings, plating sludges, paints, organic solvents, oil and grease, and miscellaneous chemicals. The sludge impoundment area is included as a hazardous waste management unit in the Air Station's RCRA Part B Permit. A fenced, paved area formerly used for storage of petroleum product drums is also located at Site 10. The area is no longer in use for drum storage.

Site 44A - Former Sludge Application Area

Site 44 consists of two areas in which sludge from the sewage treatment plant was applied. Liquid sludge was removed from the digesters for land application every 30 days. Sludge removed between September and November, 1987 was applied at Sites 10 and 21. Site 44A is located on Site 10 (OU2), and Site 44B is located on Site 21 (OU13). Site 44B is not discussed further as it is not an OU2 site. The sludge contained organic material and other constituents that were not digested during the sewage treatment process.

Site 46 - Polishing Ponds No. 1 and No. 2

This site consists of two inactive unlined ponds used as aeration basins for wastewater from the Sewage Treatment Plant (STP). The ponds are approximately 12 feet deep. The STP was recently upgraded and does not require the use of the ponds for aeration.

Site 76 - Vehicle Maintenance Area (Hobby Shop)

Site 76 consists of a building and parking lot where personal vehicles are repaired. General auto maintenance and auto body repair are typical work activities conducted at this facility.

Previous Investigations at MCAS Cherry Point

Investigations at MCAS Cherry Point are conducted under the Department of Defense (DOD) Installation Restoration Program (IRP) and the Department of the Navy Assessment and Control of Installation Pollutants (NACIP) Program, which were started in 1980. Funding to pay for such investigations is allocated for DOD sites under the Defense Environmental Restoration Account (DERA).

The IR/NACIP programs parallel CERCLA, otherwise known as Superfund. Under the Superfund Program, abandoned waste sites that potentially contained hazardous constituents undergo several phases of environmental investigation which would ultimately determine the need for a remedy, and if necessary, the selection and implementation of the remedy for the site. These phases of investigation include the Preliminary Assessment/Site Inspection (PA/SI), RI, FS, ROD, and Remedial Design/Remedial Action (RD/RA). Superfund also has provisions for Interim Measures (IM) that can be implemented if a site poses an immediate threat to the environment.

CERCLA (IRP)

The first IRP objective is to collect data and evaluate historical evidence indicating the existence of hazardous constituents that may have contaminated the facility or that pose an imminent health hazard on or off the facility. The Initial Assessment Study (IAS) was performed at MCAS Cherry Point in 1983 to meet this objective. The IAS identified 14 suspect sites for further investigation. The Superfund Amendments and Reauthorization Act (SARA) of 1986 required each facility listed on the Federal Agency Hazardous Waste Compliance Docket (MCAS Cherry Point is included on the docket) to perform a PA. The IAS was essentially equivalent to, and served as, the PA under the Superfund Program.

The second IRP objective is to determine, via sampling and analyses activities, whether specific constituents identified in the IAS, and possibly other contaminants, exist in concentrations considered to be hazardous. SI and RI activities were performed at several of the sites during the mid-1980s to meet this objective. SI activities are limited data collection tasks to determine whether contamination exists, whereas RI activities are larger tasks to determine the nature and extent of contamination.

RCRA

The Resource Conservation and Recovery Act (RCRA) of 1976 established a national strategy for the management of ongoing solid and hazardous waste operations at active sites. Because MCAS Cherry Point engages in the generation, and storage of hazardous wastes, the facility must be permitted under the

jurisdiction of RCRA. The Hazardous and Solid Waste Amendments (HSWA) of RCRA, enacted in 1984, broadened the authority of RCRA, including requiring a multi-step corrective action process for releases of hazardous wastes to the environment.

The RCRA corrective action process closely resembles the CERCLA program.

RCRA	CERCLA	Process
RCRA Facility Assessment (RFA)	PA/SI	Release Identification
RCRA Facility Investigation (RFI)	RI	Release Extent Characterization
Corrective Measures Study (CMS)	FS	Evaluation Remedy
Corrective Measures Implementation (CMI)	RA	Remedy Implementation

The RCRA corrective action program also includes an interim measures (IM) step that may be conducted in cases where short-term actions are needed to respond to immediate threats.

In 1988, EPA performed a RFA at Cherry Point. The RFA identified 114 Solid Waste Management Units (SWMUs) and two other areas of concern (AOCs), some of which were sites already being investigated under the IRP.

In 1989, the Navy entered into a RCRA Administrative Order on Consent with the USEPA to agree to perform an RFI at 32 of the 114 identified SWMUs. The list included all of the sites that were previously being investigated as CERCLA sites under the IRP. In addition, the Administrative Order on Consent designated the USEPA as the lead regulatory agency of MCAS Cherry Point.

MCAS Cherry Point was placed on the National Priorities List (NPL) in December, 1994. The investigations at each site are being conducted to meet the requirements of both RCRA and CERCLA. The 32 IRP sites have been combined into 13 Operable Units (OU1 through OU13) by the Navy. One operable unit, OU12, has been deferred to the State of North Carolina's underground storage tank program.

Other

In addition to the IRP activities being conducted, a total of 11 sites are being investigated as part of the Navy Base Realignment and Closure (BRAC) Program. These sites are being investigated to determine whether environmental contamination exists that could affect construction and long-term use activities that are planned for the sites.

Previous Investigations at OU2

OU2 has been investigated over a period of several years, and the results are presented in various reports. All of these documents may be found in the administrative record:

- Remedial Investigation Interim Report, October 1988 (NUS Corporation): Provides the results of groundwater, surface water, sediment, and leachate seep sampling and analysis conducted at Site 10 under the IRP.

- Water Resources Investigations Report 89-615. 1990 (U.S. Geological Survey [USGS]): Provides the results of groundwater sampling and analysis conducted by the USGS.

- Water Resources Investigations Report 89-4200, 1990 (USGS): Provides additional results of groundwater sampling and analysis conducted by the USGS.

- RCRA Facilities Investigations Report (RFI) - Units 5, 10, 16, 17, May 1991 (NUS Corporation): Provides results of additional investigations conducted at Site 10 following signing of the RCRA Consent Order, including soil, surface water, sediment, and groundwater sampling and analysis.

- Evaluation and Recommendations - Unit 10 Former Sludge Impoundment Area, May 1991 (Halliburton NUS Corporation): Provides the results of soil sampling conducted before and after closure of the former sludge area at Site 10.

- RCRA Facilities Investigation and Corrective Measures Study Final Technical Direction Memorandum (TDM) for Units 10 and 16, November 1992 (Halliburton NUS Corporation): Provides the results of additional soil sampling conducted at Site 10 to address data gaps identified upon completion of the RFI.

- RCRA Facilities Investigation (RFI) - 21 Units, June 1993 (Halliburton NUS Corporation): Provides the results of soil sampling and analysis at Site 44A (formerly Site 45) conducted following signing of the RCRA Consent Order.

- Phase II Technical Direction Memorandum, June 1994 (Halliburton NUS Corporation): Provides the results of additional soil sampling conducted to address data gaps identified upon completion of the TDM.

- Remedial Investigation (RI) Report, July 1996 (Brown & Root Environmental): Presents the results of soil, groundwater, surface water, and sediment sampling conducted in 1994; soil and leachate seep data collected in 1995; and surface water, soil, and groundwater data collected in 1996. Summarizes previous data collected from past investigations.

Remedial Investigation

The following sections summarize the nature and extent of contamination based on more recent sampling events.

Surface Soil

Surface soil contamination is minimal. Only a few volatile organic compounds were detected. Several semivolaitle organic compounds limited to polynuclear aromatic hydrocarbons (PAHs) were found in one surface soil sample. A wide variety of pesticides was detected; however, the detections were scattered throughout OU2. PCBs were detected in two surface soil samples. Metals were more frequently detected in surface soils than organics, although the concentrations were not notably elevated above background levels. In general, no particular patterns of surface soil contamination were noted. The maximum concentrations of individual analytes detected were found at various locations.

Subsurface Soil

The results for subsurface soil samples show that volatile organic compounds were not detected frequently, but were detected at notable concentrations in a limited number of samples. Fuel-type constituents (benzene, toluene, ethylbenzene, xylenes [BTEX], 2-methylnaphthalalene, and naphthalene) were detected in a number of samples; however, the vast majority of subsurface soil samples did not contain these compounds at detectable levels. Although, the primary detections were scattered throughout the site, they suggest potential areas for BTEX in groundwater. Another group of compounds potentially related to the observed groundwater contamination are chlorinated solvents, such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride. While not widespread in subsurface soil, their presence appears to correlate with observed areas of these compounds in the surficial aquifer. Other compounds of note in subsurface soil include several phenolic compounds (phenol, 2,4-dimethylphenol, and 4-methylphenol). Ketones and several of the more soluble PAHs were also detected. Pesticides were not frequently detected, and there is no apparent pattern to the detections. The concentrations of metals in subsurface soil were greater than those measured in background soil samples; however, metals were not widespread or common contaminants. A limited number of locations have high concentrations of metals.

Copper, lead, and zinc were detected frequently at concentrations greater than background and appear to be the most widespread.

Surficial Aquifer Groundwater

Shallow groundwater at OU2 flows toward Slocum Creek and Turkey Gut. The surficial aquifer contains many volatile organic compounds at concentrations that exceed Federal drinking water standards and/or state groundwater quality standards. Some of the more prevalent contaminants are benzene, chlorobenzene, dichlorobenzenes, 1,1-dichloroethane, vinyl chloride, 1,2-dichloroethene, and trichloroethene. Semivolatile organic compounds were frequently detected and included phenols, phthalate esters, and some of the more soluble PAHs. A number of pesticides were detected, but many were found only in single samples at very low concentrations. Several metals, including arsenic, cadmium, iron, and manganese, were detected at concentrations that exceeded Federal drinking water standards or state groundwater standards. The detections of arsenic and cadmium were neither widespread or numerous. Many of the detections of iron and manganese exceeded the standards. In summary, volatile organics are the major concern. Other contaminants, except for iron and manganese, were not found frequently, nor were they found frequently at concentrations that exceeded standards. Generally, contaminant concentrations in the surficial aquifer have been decreasing over time; however, exceptions to this were noted in some of the monitoring wells.

Yorktown Aquifer Groundwater

Groundwater in the Yorktown aquifer flows toward Slocum Creek. Contamination in this aquifer does not appear to be a problem. The only organic contaminants detected at concentrations that exceeded state groundwater standards were chloroform and bis(2-ethylhexyl)phthalate. Metal concentrations were below drinking water and groundwater quality standards; except for iron and manganese, whose standards are based on aesthetic concerns.

Leachate Seeps

Few organic compounds were detected in leachate seep water samples. A few volatile organics and several pesticides were detected at low concentrations. The concentrations of some metals exceeded those in the surficial aquifer, while others did not. Sediment samples from dry leachate seeps were similar in concentrations to surface soil samples.

Polishing Pond Sediment

Sediment from the polishing ponds contains a number of organic chemicals, while the underlying soils contain fewer organics at lower concentrations. Generally, the pond sediments contain higher concentrations of metals than the underlying soils.

Surface Water and Sediment

The surface water samples collected from Turkey Gut and Slocum Creek do not contain notable levels of contamination. Volatile organics were detected in several surface water samples. The types of contaminants detected are similar to those detected in the surficial aquifer, but at lower concentrations. Pesticides were detected in several surface water samples; however, their presence may be related to suspended sediment material. Pesticides and metals were the most frequently detected analytes in sediment samples from Slocum Creek and Turkey Gut. Several pesticides were detected at upstream sample locations. This may be a result of widespread use of pesticides and not strictly as a result of site activities. The concentrations of metals in sediment from both streams do not appear to indicate the presence of a major onsite source area. In general, there was no apparent pattern to the contaminants detected in surface water or sediment.

Summary of Site Risks

As part of the RI, human health and ecological risk assessments were conducted to evaluate the current or future potential risks to human health and ecological receptors resulting from the existing site contaminants.

Baseline Human Health Risk Assessment

A human health risk assessment was conducted for OU2 using the most recent USEPA and USEPA Region IV guidance documents. The risk assessment was conducted for chemicals of potential concern (COPCs) detected in the various media at OU2. COPCs were determined by comparing concentrations of site contaminants to risk-based screening concentrations developed by USEPA Region III and, in the case of soil and sediment, to background soil concentrations. COPCs were identified for chemicals detected in soil, groundwater, surface water, and sediment. Residential exposure levels were used for soil and sediment. Risk-based concentrations for residential use of groundwater were used to identify COPCs for groundwater and surface water. The COPCs identified at OU2 are listed in Table 1.

TABLE 1

MEDIA-SPECIFIC CHEMICALS OF POTENTIAL CONCERN (COPCs)
OPERABLE UNIT 2
MCAS CHERRY POINT, NORTH CAROLINA

Surface Soil (0 to 2 Feet)	All Soil (0 to 10 Feet)	Groundwater	Leachate Seeps	Surface Water	Sediment	Polishing Pond Sediment
Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Chrysene Indeno(1,2,3-cd)pyrene Aroclor-1260 Aluminum Antimony Arsenic Beryllium Cadmium Chromium Iron Manganese Thallium	Arsenic Cadmium Lead	**Surficial Aquifer:** 1,1-Dichloroethene 1,2-Dichloroethane 1,2-Dichloropropane 2-Butanone 2-Hexanone 4-Methyl-2-pentanone Benzene Chlorobenzene Chloroform Chloroethane cis-1,2-Dichloroethene Ethylbenzene Tetrachloroethene Toluene Trichloroethene Vinyl chloride 1,2-Dichlorobenzene 1,4-Dichlorobenzene 2-Methylnaphthalene 2-Methylphenol 2,4-Dimethylphenol 4-Methylphenol Bis(2-chloroethyl)ether Bis(2-ethylhexyl)phthalate Naphthalene Nitrobenzene 4,4'-DDE 4,4'-DDT Aldrin	Benzene Chloroethane Vinyl chloride 4,4'-DDT Aldrin γ-BHC Dieldrin Heptachlor Antimony Arsenic Cadmium Iron Lead Manganese Nickel Thallium	**Turkey Gut:** Bis(2-ethylhexyl)phthalate Heptachlor epoxide Arsenic **Slocum Creek:** 4,4'-DDD	**Turkey Gut:** Aluminum Antimony Arsenic Beryllium Iron Manganese **Slocum Creek:** Aluminum Antimony Arsenic Chromium Iron Manganese	None

TABLE 1 (Continued)
MEDIA-SPECIFIC CHEMICALS OF POTENTIAL CONCERN (COPCs)
OPERABLE UNIT 2
MCAS CHERRY POINT, NORTH CAROLINA

Surface Soil (0 to 2 Feet)	All Soil (0 to 10 Feet)	Groundwater	Leachate Seeps	Surface Water	Sediment	Polishing Pond Sediment
		Surficial Aquifer: (Continued) α-BHC γ-BHC Endosulfan I Endosulfan II Endrin Aldehyde Heptachlor Heptachlor epoxide Aluminum Arsenic Barium Cadmium Iron Manganese **Yorktown Aquifer:** Chloroform Bis(2-ethylhexyl)phthalate Iron Manganese				

A conceptual site model was developed for OU2 to define potential receptors and the routes by which they are likely to be exposed. Identified receptors under current land use conditions included maintenance workers, trespassers, and recreational users of Slocum Creek. In addition, residents, full-time employees, and construction workers were also considered under future land use conditions. Figure 4 represents the model used to evaluate potential receptors at OU2. The future residential exposure pathway for soil or groundwater is extremely unlikely because the majority of OU2 is comprised of a sanitary landfill. In addition, ingestion of groundwater from the surficial aquifer by future residents is unlikely to occur because this aquifer is not used as a potable water source.

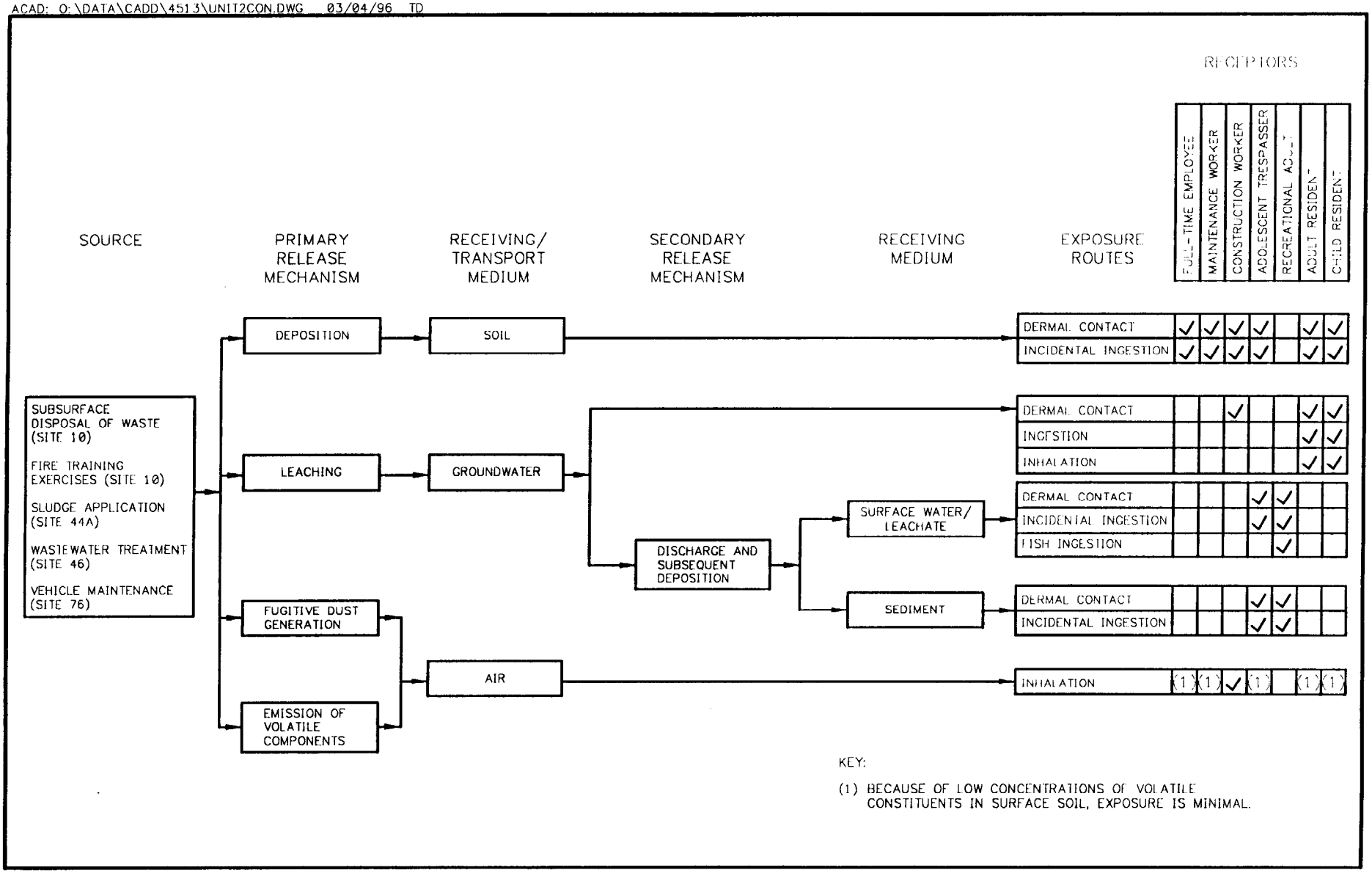
Risks were calculated using USEPA derived algorithms. For carcinogens, an incremental lifetime cancer risk (ICR) of 1E-6 (a one-in-one-million risk) is generally considered the point at which the agency evaluates "unacceptable" risks. The USEPA generally considers risks within the target range of 1E-6 to 1E-4 to be "acceptable," whereas risks greater than 1E-4 are generally considered to be "unacceptable". For noncarcinogens, a Hazard Index (HI) of 1 is considered to represent the breaking point between "acceptable" and "unacceptable" risks. Hazard Indices are not statistical values like cancer risks. A summary of cumulative risks at OU2 for seven receptor categories is presented in Table 2.

The risks shown in Table 2 indicate that they are within the target risk range except for the construction worker (Hazard Index), adult resident (Hazard Index and cancer risk), and child resident (Hazard Index and cancer risk).

The majority of the cancer risk to future residents is from ingestion of shallow groundwater (surficial aquifer) containing arsenic and vinyl chloride. For noncarcinogenic risks, individual exposure routes with HIs greater than 1 were ingestion of soil containing thallium by a child resident and ingestion of groundwater containing arsenic and manganese by adults and children.

A 30-year residential exposure scenario was also evaluated. This scenario is highly unlikely to occur as long as the property remains in military use. Incremental cancer risks associated with exposure to soil for this receptor assume 6 years of exposure as a small child and an additional 24 years of exposure as an older child and adult. The incremental cancer risk for the adult receptor under this scenario is 7.0E-3 (which exceeds the USEPA target risk range). Arsenic and vinyl chloride are the major risk drivers for groundwater, and arsenic and Aroclor-1260 drive the soil risks.

The noncarcinogenic risk to a future construction worker is driven by dermal contact with groundwater and incidental ingestion of soil. Thallium and antimony are the major soil chemicals, and chlorobenzene and manganese are the major groundwater chemicals that contribute to this risk. Individually, these compounds



CONCEPTUAL SITE MODEL
OPERABLE UNIT 2
MCAS CHERRY POINT, NORTH CAROLINA

FIGURE 4

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TABLE 2

SUMMARY OF CUMULATIVE RISKS
OPERABLE UNIT 2
MCAS CHERRY POINT, NORTH CAROLINA

Receptor	Exposure Pathway	Cancer Risk	Hazard Index
Maintenance Worker	Direct contact with surface soil.	3.8E-7	2.0E-1
Construction Worker	Direct contact with soil and groundwater; inhalation of fugitive dust.	2.6E-6	2.0E-1
	Direct contact with polishing pond sediment.	3.8E-7	1.5E-1
Adolescent Trespasser	Direct contact with surface soil and leachate seeps	2.3E-7	1.3E-2
	Direct contact with Slocum Creek water and sediment	2.9E-8	3.3E-2
	Direct contact with Turkey Gut water and sediment	4.7E-8	5.4E-3
Adult Recreational User	Direct contact with Slocum Creek water and sediment; ingestion of fish.	2.7E-7	3.2E-1
Full-Time Employee	Direct contact with surface soil.	7.8E-6	1.3E-1
Adult Resident (6 year)	Direct contact with groundwater (surficial aquifer) and surface soil.	6E-4*(1)	2.7E+1*
	Direct contact with groundwater (Yorktown aquifer) and surface soil.	8.2E-7	3.8E-1
Child/Adult Resident (30 year)	Direct contact with groundwater (surficial aquifer) and surface soil.	7.0E-3*	9.1E+1*
	Direct contact with groundwater (Yorktown aquifer) and surface soil.	2.9E-6	1.3E+0*
Child Resident	Direct contact with groundwater (surficial aquifer) and surface soil.	1.5E-3*	6.5E+1*
	Direct contact with groundwater (Yorktown aquifer) and surface soil.	2.1E-6	8.9E-1

(1) An asterisk indicates an "unacceptable" risk.

had HIs of approximately 0.1 (antimony, thallium, and chlorobenzene) to 0.3 (manganese). Therefore, when target organs are considered, the HIs are below 1 for each target organ effect, and there would not be a risk to the future construction worker under the exposure scenario evaluated.

In addition to the future potential exposure to the surficial aquifer, potential potable use of the Yorktown aquifer was also considered. These risks were not included in the risk summary tables, as both aquifers would not be used as a source of potable water at the same time. The risks associated with use of the groundwater in the Yorktown aquifer fall within the USEPA's target risk range, except for the HI for the 30-year resident.

Ecological Assessment

Several wetland areas were identified at OU2 during a field survey conducted in April 1995. The wetlands are adjacent to Slocum Creek and Turkey Gut and are classified as Coastal Plain Small Stream Swamp areas.

A preliminary ecological assessment was performed using the maximum concentrations of chemicals detected in surface water, sediment, and surface soil. The ratio of the concentration to a reference toxicity concentration is known as a Hazard Quotient (HQ). If this ratio exceeds a value of 1, adverse ecological effects might be expected, particularly in sensitive species residing the these areas of maximum concentration. Aquatic organisms inhabiting Slocum Creek and Turkey Gut may be exposed to contaminants via direct contact with surface water and sediment and ingestion of surface water and sediment. In addition to the contaminant screening, food chain modeling was performed for the eastern cottontail rabbit, red fox, and red-tailed hawk. Exposure pathways included ingestion of soil (maximum and average concentrations), vegetation, contaminated prey, and drinking water.

There is no risk posed to ecological receptors at OU2 from contaminants in soil, Slocum Creek, or Turkey Gut based on the use of the conservative ecological screening process and specific site information and conditions. Only a few COPCs were identified at OU2, and the HQs were relatively low. Detections of many of the COPCs were isolated. Although HQs for some chemicals exceeded a value of 1, this occurs only at localized areas (i.e., single sample locations). Potential receptors would not be exposed to these areas all the time. In addition, the risk values generated from the food chain models were based on scattered detections of chemicals and were mainly driven by uncertainty in toxicity data, rather than actual risk.

Feasibility Study

Following completion of the RI, a Feasibility Study (FS) was conducted which evaluated remedial action alternatives for contaminated environment media that could be employed to minimize risks associated with OU2. The FS evaluated six alternatives which included no action, the implementation of institutional controls, and four additional treatment/containment options. The FS evaluated the short- and long-term effectiveness, compliance with applicable regulations, costs, and other criteria for each of the remedial alternatives. From this evaluation, a proposed preferred alternative was identified and is presented in this PRAP.

Scope and Role of the Proposed Remedial Action Alternative

OU2 is one of 13 operable units designated by the Navy at MCAS Cherry Point. One operable unit, OU12, has been deferred to the State of North Carolina's underground storage tank program. The remaining operable units are being investigated as part of a comprehensive facility investigation. The timing and co-ordination of this investigation have been addressed in the MCAS Cherry Point Site Management Plan. The estimated schedule for remedial investigation, design, and construction activities at the 12 operable units at Cherry Point extends past the year 2000.

Because the four sites that constitute OU2 are adjacent, remedial action alternatives were developed for OU2 as a whole, rather than for each site. Based on the human health risk assessment, groundwater and soil were determined to be the only environmental media of concern at OU2. Much of the groundwater in the surficial aquifer associated with OU2 contains contaminants at concentrations that exceed drinking water standards and state groundwater standards. As a result, the remedial action alternatives for OU2 were developed to address groundwater in the surficial aquifer and soil. More specifically, the alternatives were developed to address areas where surficial aquifer groundwater exceeded remediation goals and areas where soil "hot spots" could contribute to groundwater contamination.

The proposed remedial action alternative, as originally introduced in the FS Report, is based on the nature and extent of contamination and associated future potential risks to human health or the environment. The proposed remedial action alternative for soil is institutional controls, and the proposed alternative for groundwater is extraction, pretreatment and discharge to STP, and institutional controls.

The proposed remedial action would achieve the following objectives for OU2:

- Soil - Prevent future potential exposure to contaminated soils, including former disposal area waste materials.

- Groundwater (surficial aquifer) - Prevent future potential exposure to contaminated groundwater, and prevent groundwater from migrating offsite.

Institutional controls for the soils would involve designation of the sites as restricted or limited-use areas in the Air Station Master Plan, in order to restrict the sites to nonresidential uses and prevent uncontrolled construction activities. The Air Station Master Plan is an all-encompassing planning document for future land use activities. Although surficial aquifer groundwater at OU2 is not used for drinking, it flows into Turkey Gut and Slocum Creek and therefore, may migrate off site causing potential harm to the environment. Groundwater extraction, pretreatment and discharge to the STP, which will then further treat to meet surface stream standards prior to discharging to the Neuse River, would be protective of the environment. Institutional controls for the groundwater would involve providing groundwater use restrictions in the Air Station Master Plan that would prohibit installation of potable water supply wells in the vicinity of the sites (the Air Station currently uses a deeper, clean aquifer for its drinking water). A groundwater and surface water monitoring (i.e., sampling) program would be implemented to track contaminant levels in these media over time.

Summary of Alternatives

Various technologies and process options were screened and evaluated under the FS. Ultimately 6 remedial action alternatives were developed and are listed as follows:

- Alternative 1 No Action.

- Alternative 2 Institutional Controls and Monitoring.

- Alternative 3 Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to Sewage Treatment Plant (STP); Institutional Controls.

- Alternative 4 In-situ Soil "Hot Spot" Treatment; Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; Institutional Controls.

- Alternative 5 Excavation, Consolidation, and Containment of Contaminated Soil; Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; Institutional Controls.

- Alternative 6 Excavation, Treatment, and Disposal of Contaminated Soil; Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; and Institutional Controls.

A brief description and the estimated cost of each alternative follows:

Alternative 1 - No Action

Capital Cost: $0
Annual Operation and Maintenance (O&M) Cost: $0
Net Present Worth: $0
Time to Implement: None

The No Action Alternative is required under CERCLA to establish a baseline for comparison. Under this alternative, no actions will be performed to reduce the toxicity, mobility, or volume of the contaminated soil or groundwater at OU2. This alternative assumes that passive remediation will occur via biodegradation and other natural attenuation processes and that contaminant levels will be reduced over an indefinite period of time.

Since contaminants will remain at OU2 under this alternative, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 2 - Institutional Controls and Monitoring

Capital Cost: $71,000
Annual O&M Cost: $35,000
Net Present Worth: $549,000
Time to Implement: Less than one year

Under Alternative 2, no remedial actions will be performed to reduce the toxicity, mobility, or volume of the contaminated soil and groundwater at OU2. Instead, institutional controls will be imposed to eliminate or reduce pathways of exposure to contaminants at OU2. These institutional controls would involve aquifer-use

restrictions and designation of the area as a restricted or limited-use area. The area would be given a land use category in the Air Station Master Plan that would prohibit residential use of the area as well as invasive construction activities and installation of wells. The existing fencing and warning signs would be repaired and replaced as needed. In addition, groundwater monitoring and surface water monitoring will be implemented for OU2.

Contamination present in contaminated soil and the former disposal area could act as a future source of additional groundwater or surface water contamination. Contaminant trends would be analyzed to assess whether any portion of the disposal area is acting as a source of groundwater contamination over the long term. Monitoring would consist of the annual sampling of groundwater in the surficial and Yorktown aquifers and surface waters in Slocum Creek and Turkey Gut to assess the migration of contaminants from OU2 into the environment.

Since contaminants will remain at OU2 under this alternative, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 3 - Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; Institutional Controls

Alternative 3A - Groundwater Extraction; Treatment and Discharge to Slocum Creek; Institutional Controls

Capital Cost: $4.4 million
Annual O&M Cost: $385,000
Net Present Worth: $10.4 million
Time to Implement: One to two years

Alternative 3A will involve institutional controls and media monitoring to measure the effects of the alternative, as discussed in Alternative 2. In addition, a groundwater extraction and treatment system will be installed to contain the contaminants in the surficial aquifer by restricting lateral and vertical migration of the groundwater. The extraction system would consist of 19 wells located near the boundaries of Slocum Creek and Turkey Gut. The treatment of contaminated groundwater will involve equalization, pH adjustment/chemical precipitation, clarification, sand filtration, and carbon adsorption at a newly constructed, centrally located treatment building. Treated groundwater will be directly discharged into Slocum Creek.

Until the remediation levels are met, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 3B - Groundwater Extraction; Pretreatment and Discharge to STP; Institutional Controls

Capital Cost: $2.3 million
Annual O&M Cost: $186,000
Net Present Worth: $5.2 million
Time to Implement: One to two years

Alternative 3B will involve institutional controls and media monitoring to measure the effects of the alternative, as discussed in Alternative 2. In addition, a groundwater extraction system will be installed to contain the contaminants in the surficial aquifer. The extraction system would be the same as for Alternative 3A. However, extracted groundwater will be pretreated and discharged to the STP instead of Slocum Creek. Pretreatment of extracted groundwater will be less rigorous and will include equalization and aeration for iron oxidation, followed by pH adjustment, at a newly constructed, centrally located treatment building.

Until the remediation levels are met, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 4 - In-situ Soil "Hot Spot" Treatment; Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; Institutional Controls

Alternative 4A - In-situ Soil "Hot Spot" Treatment; Groundwater Extraction; Treatment and Discharge to Slocum Creek; Institutional Controls

Capital Cost: $5.0 million
Annual O&M Cost: $395,000
Net Present Worth: $11.2 million
Time to Implement: Two to three years - (One to two years for "hot spot" treatment)

Alternative 4A includes the same components of remediation as Alternative 3A. In addition, treatment of groundwater and soil greatly in excess of Remedial Goal Options (RGOs) using air sparging/soil vapor extraction (AS/SVE) technologies will be employed to eliminate "hot spots". AS/SVE technology involves injecting air below the water table to aid in the volatilization of contaminants and then capturing the contaminant-laden air in the vadose zone for off-gas treatment.

Until the remediation levels are met, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 4B - In-situ Soil "Hot Spot" Treatment; Groundwater Extraction; Pretreatment and Discharge to STP; Institutional Controls

Capital Cost: $2.9 million
Annual O&M Cost: $195,000
Net Present Worth: $6.0 million
Time to Implement: Two to three years. (One to two years for "hot spot" treatment)

Alternative 4B includes the same components of remediation as Alternative 3B. In addition, treatment of soil and groundwater greatly in excess of RGOs using air sparging/soil vapor extraction technologies will be employed to eliminate "hot spots" and potentially reduce overall remediation time. AS/SVE technology involves injecting air into wells screened in the surficial aquifer to aid in the volatilization of contaminants and then capturing the contaminant laden air in wells screened in the vadose zone for off-gas treatment.

Until the remediation levels are met, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 5 - Excavation, Consolidation, and Containment of Contaminated Soil; Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; Institutional Controls

Alternative 5A - Excavation, Consolidation, and Containment of Contaminated Soil; Groundwater Extraction; Treatment and Discharge to Slocum Creek; Institutional Controls

Capital Cost: $5.2 million
Annual O&M Cost: $385,000
Net Present Worth: $11.2 million
Time to Implement: One to two years

Alternative 5A includes the same components of remediation as Alternative 3A. In addition, soils contaminated at levels exceeding groundwater protection and surface soil RGOs will be excavated, consolidated, and capped using a multilayer cap to minimize the potential for human contact and to reduce the migration of the contaminated material due to infiltration, surface water runoff, and wind erosion. To

minimize excavation and transportation requirements, the consolidation area will be the largest single area that exceeds RGOs. The cap would consist of (from bottom to top) 24 inches of clay, a flexible synthetic membrane, a 12-inch drainage layer, and 24 inches of soil and vegetative cover.

Because contaminants will remain on site, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 5B - Excavation, Consolidaiton, and Containment of Contaminated Soil; Groundwater Extraction; Pretreatment and Discharge to STP; Institutional Controls

Capital Cost: $3.1 million
Annual O&M Cost: $186,000
Net Present Worth: $6.0 million
Time to Implement: One to two years

Alternative 5B includes the same components of remediation as Alternative 3B. In addition, soils contaminated at levels exceeding groundwater protection and surface soil RGOs will be excavated, consolidated and capped using a multilayer cap to minimize the potential for human contact and to reduce the migration of the contaminated material due to infiltration, surface water runoff, and wind erosion. To minimize excavation and transportation requirements, the consolidation area will be the largest single area that exceeds RGOs. The cap would consist of (from bottom to top) 24 inches of clay, a flexible synthetic membrane, a 12-inch drainage layer, and 24 inches of soil and vegetative cover.

Because contaminants will remain on site, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 6 - Excavation, Treatment, and Disposal of Contaminated Soil; Groundwater Extraction; Treatment and Discharge to Slocum Creek or Pretreatment and Discharge to STP; Institutional Controls

Alternative 6A - Excavation, Treatment, and Disposal of Contaminated Soil; Groundwater Extraction; Treatment and Discharge to Slocum Creek; Institutional Controls

Capital Cost: $8.1 million
Annual O&M Cost: $385,000
Net Present Worth: $14.1 million
Time to Implement: Two to three years

Alternative 6A includes the same components of remediation as Alternative 3A. In addition, contaminated soil in excess of the RGOs will be excavated and treated, based on the contaminants of concern, to immobilize and/or remove contaminants. Metals contamination in the soil will be immobilized using chemical fixation/solidification technologies that bind the chemical to a solid matrix which is resistant to leaching. Solidified material will be used as backfill and capped using the same cap design as Alternatives 5A and 5B. Soil contaminated with volatile organics will be treated using thermal desorption technologies. These technologies use indirect or direct heating of the soil to thermally desorb or volatilize organic contaminants. The clean soil will be used as general backfill. Off-gas from the process would be treated through a secondary treatment system.

Because contaminants will remain on site, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Alternative 6B - Excavation, Treatment and Disposal of Contaminated Soil; Groundwater Extraction; Pretreatment and Discharge to STP; Institutional Controls

Capital Cost: $6.0 million
Annual O&M Cost: $186,000
Net Present Worth: $8.9 million
Time to Implement: Two to three years

Alternative 6B includes the same components of remediation as Alternative 3B. In addition, contaminated soil in excess of the RGOs will be excavated and treated, based on the contaminants of concern, to immobilize and/or remove contaminants in the soil phase. Metals contamination in the soil will be immobilized using chemical fixation/solidification technologies that bind the chemical to a solid matrix which is resistant to leaching. Solidified material will be used as backfill and capped using the same cap design as Alternatives 5A and 5B. Soil contaminated with volatile organics will be treated using thermal desorption technologies. These technologies use indirect or direct heating of the soil to thermally desorb or volatilize

organic contaminants. The clean soil will be used as general backfill. Off-gas from the process would be treated through a secondary treatment system.

Because contaminants will remain on site, the NCP requires the lead agency to review the effects of this alternative at least once every five years.

Evaluation of Alternatives

This section summarizes the comparative evaluation of remedial action alternatives for OU2. In order to identify the preferred alternative, the alternatives were evaluated against nine evaluation criteria provided in the USEPA publication entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA". These criteria are: (1) overall protection of human health and the environment; (2) compliance with applicable or relevant and appropriate requirements (ARARs); (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume through treatment; (5) short-term effectiveness; (6) implementability; (7) cost; (8) USEPA and state acceptance; and (9) community acceptance. Both the USEPA and NCDEHNR (the state) have reviewed this PRAP and concur with the preferred alternative. However, based on new information and/or public comments, the Navy, in consultation with USEPA and NCDEHNR, may modify the preferred alternative or select another remedial alternative. Therefore, the public is encouraged to review and comment on all of the remedial action alternatives, as well as other information presented herein and in the RI and FS Reports. Following a review of the public comments, the community acceptance criterion will be assessed in the Responsiveness Summary within the ROD.

A complete summary of the evaluation of alternatives is presented in Table 3. A glossary of the evaluation criteria is presented in Table 4. The following information summarizes and compares the remedial action alternatives using seven evaluation criteria.

Overall Protection of Human Health and the Environment

Alternative 1, the no action alternative, does not reduce potential risks to human health and the environment except through natural attenuation of the groundwater. Alternatives 2, 3, 4, 5, and 6 all provide some means, other than natural attenuation, for reducing potential risks. Alternatives 2, 3, 4, 5, and 6 involve institutional controls which will reduce risks. Alternatives 3, 4, 5, and 6 involve active groundwater remediation systems (groundwater extraction and treatment) which will provide additional protection of human health and the environment by preventing groundwater migration to surface waters. Alternatives 4, 5, and 6 involve active soil remediation systems (air sparging/soil vapor extraction; excavation, consolidation

TABLE 3

SUMMARY OF EVALUATION OF ALTERNATIVES
PROPOSED REMEDIAL ACTION PLAN, CTO 211
OPERABLE UNIT 2, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Evaluation Criteria	Alternative 1: No Action	Alternative 2: Institutional Controls and Monitoring	Alternative 3A: GW Extraction, Treatment, Discharge to Slocum Creek	Alternative 3B: GW Extraction, Pretreatment, Discharge to STP
Threshold Criteria				
Overall Protection of Human Health and Environment	No reduction in potential risks except through natural attenuation of the groundwater.	Institutional controls and monitoring will reduce potential risks to human health and the environment under realistic exposure scenarios.	Institutional controls and monitoring provide some protection of human health and the environment. Groundwater containment using extraction wells provides some additional protection.	Institutional controls and monitoring provide some protection of human health and the environment. Groundwater containment using extraction wells provides some additional protection.
Compliance with ARARs Chemical-Specific ARARs	No active effort to reduce contaminant levels to below federal or state ARARs.	Can meet NCGWQ criteria following natural attenuation or if shallow aquifers can be reclassified from drinking water.	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.
Location-Specific ARARs	Not applicable.	Not applicable.	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.
Action-Specific ARARs	Not applicable.	Not applicable.	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.
Primary Balancing Criteria				
Long-Term Effectiveness and Permanence	Allows risk to remain uncontrolled.	Monitoring and use restrictions provide adequate and reliable controls.	Removal of contaminated groundwater will reduce site hazards to potential land users. Institutional controls will further limit risks.	Removal of contaminated groundwater will reduce site hazards to potential land users. Institutional controls will further limit risks.
Reduction of Toxicity, Mobility, or Volume through Treatment	No treatment.	No treatment.	The volume and toxicity of contaminated groundwater would be reduced through active remediation. Residuals created that require disposal.	The volume and toxicity of contaminated groundwater would be reduced through active remediation. Residuals created that require disposal.

TABLE 3 (Continued)
SUMMARY OF EVALUATION OF ALTERNATIVES
PROPOSED REMEDIAL ACTION PLAN, CTO 211
OPERABLE UNIT 2, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Evaluation Criteria	Alternative 1: No Action	Alternative 2: Institutional Controls and Monitoring	Alternative 3A: GW Extraction, Treatment, Discharge to Slocum Creek	Alternative 3B: GW Extraction, Pretreatment, Discharge to STP
Short-Term Effectiveness	Not applicable, no short term impacts/concerns at site.	Minor risks to workers involved in monitoring of groundwater and surface waters. No impacts to community upon implementation of institutional controls. Less than one year to implement.	Proper system management will limit short term hazards associated with contaminated media treatment. Groundwater RGOs achieved is about 60 years. One to two years to implement.	Proper system management will limit short term hazards associated with contaminated media treatment. Groundwater RGOs achieved in about 60 years. One to two years to implement.
Implementability	Nothing to implement. No monitoring to show effectiveness.	Enforcement of institutional controls at military site is proven to be effective and reliable. Monitoring will demonstrate effectiveness.	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.
Costs:				
Capital	$0	$71,000	$4,400,000	$2,300,000
O&M	$0	$35,000	$385,000	$186,000
NPW	$0	$549,000	$10,400,000	$5,200,000
Modifying Criteria				
U.S. EPA/State Acceptance	Not believed to be acceptable to U.S. EPA and NC.	to be determined	to be determined	to be determined

TABLE 3 (Continued)
SUMMARY OF EVALUATION OF ALTERNATIVES
PROPOSED REMEDIAL ACTION PLAN, CTO 211
OPERABLE UNIT 2, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Evaluation Criteria	**Alternative 4A: GW Extraction, Treatment, Discharge to Slocum Creek w/Hot Spot Soil Treatment**	**Alternative 4B: GW Extraction, Pretreatment, Discharge to STP w/Hot Spot Soil Treatment**	**Alternative 5A: GW Extraction, Treatment, Discharge to Slocum Creek with Consolidation and Capping**	**Alternative 5B: GW Extraction, Pretreatment, Discharge to STP with Consolidation and Capping**
Threshold Criteria				
Overall Protection of Human Health and Environment	Institutional controls and monitoring provide some protection to human health and the environment. Groundwater containment using extraction wells provides some additional protection. Soil treatment provides additional protection of human health and the environment.	Institutional controls and monitoring provide some protection to human health and the environment. Groundwater containment using extraction wells provides some additional protection. Soil treatment provides additional protection of human health and the environment.	Institutional controls and monitoring provide some protection of human health and the environment. Groundwater containment using extraction wells provides some additional protection. Consolidation and capping of contaminated soil provides additional protection of human health and the environment.	Institutional controls and monitoring provide some protection of human health and the environment. Groundwater containment using extraction wells provides some additional protection. Consolidation and capping of contaminated soil provides additional protection of human health and the environment.
Compliance with ARARs Chemical-Specific ARARs	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.
Location-Specific ARARs	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.
Action-Specific ARARs	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.
Primary Balancing Criteria				
Long-term Effectiveness and Permanence	Removal of contaminant source and contaminated groundwater will reduce site hazards to potential land users. Institutional controls will further limit risks.	Removal of contaminant source and contaminated groundwater will reduce site hazards to potential land users. Institutional controls will further limit risks.	Removal of contaminated groundwater will reduce site hazards to potential land users. Institutional controls will further limit risks.	Removal of contaminated groundwater will reduce site hazards to potential land users. Institutional controls will further limit risks.

TABLE 3 (Continued)
SUMMARY OF EVALUATION OF ALTERNATIVES
PROPOSED REMEDIAL ACTION PLAN, CTO 211
OPERABLE UNIT 2, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Evaluation Criteria	Alternative 4A: GW Extraction, Treatment, Discharge to Slocum Creek w/Hot Spot Soil Treatment	Alternative 4B: GW Extraction, Pretreatment, Discharge to STP w/Hot Spot Soil Treatment	Alternative 5A: GW Extraction, Treatment, Discharge to Slocum Creek with Consolidation and Capping	Alternative 5B: GW Extraction, Pretreatment, Discharge to STP with Consolidation and Capping
Reduction of Toxicity, Mobility, or Volume through Treatment	Active remediation will reduce the volume and toxicity of contaminated groundwater and soil. Residuals generated that require disposal.	Active remediation will reduce the volume and toxicity of contaminated groundwater and soil. Residuals generated that require disposal.	The volume and toxicity of contaminated groundwater would be reduced through active remediation. Residuals generated that require disposal.	The volume and toxicity of contaminated groundwater would be reduced through active remediation. Residuals generated that require disposal.
Short-term Effectiveness	Proper system management will limit short term hazards associated with contaminated media treatment and potential exposure to workers during alternative implementation. Groundwater RGOs achieved in about 60 years. Two to three years to implement.	Proper system management will limit short term hazards associated with contaminated media treatment and potential exposure to workers during alternative implementation. Groundwater RGOs achieved in about 60 years. Two to three years to implement.	Proper system management will limit short term hazards associated with contaminated media treatment. Possible exposure during "hot spot" consolidation & capping. Groundwater RGOs achieved in about 60 years. One to two years to implement.	Proper system management will limit short term hazards associated with contaminated media treatment. Possible exposure during "hot spot" consolidation & capping. Groundwater RGOs achieved in about 60 years. One to two years to implement.
Implementability	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.
Costs				
Capital	$5,000,000	$2,900,000	$5,200,000	$3,100,000
O&M	$395,000	$195,000	$385,000	$186,000
NPW	$11,200,000	$6,000,000	$11,200,000	$6,000,000
Modifying Criteria				
U.S. EPA/State Acceptance	to be determined	to be determined	to be determined	to be determined

TABLE 3 (Continued)
SUMMARY OF EVALUATION OF ALTERNATIVES
PROPOSED REMEDIAL ACTION PLAN, CTO 211
OPERABLE UNIT 2, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Evaluation Criteria	Alternative 6A: GW Extraction, Treatment, Discharge to Slocum Creek with Hot Spot Soil Treatment, Consolidation, and Capping	Alternative 6B: GW Extraction, Pretreatment, Discharge to STP with Hot Spot Soil Treatment, Consolidation, and Capping
Threshold Criteria		
Overall Protection of Human Health and Environment	Institutional controls and monitoring provide some protection of human health and the environment. Groundwater containment using extraction wells provides some additional protection. Soil treatment provides additional protection of human health and the environment.	Institutional controls and monitoring provide some protection of human health and the environment. Groundwater containment using extraction wells provides some additional protection. Soil treatment provides additional protection of human health and the environment.
Compliance with ARARs		
Chemical-Specific ARARs	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.	Would comply with state/federal drinking water standards except for manganese. Does not address all soil contamination in the landfill.
Location-Specific ARARs	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.
Action-Specific ARARs	Can be designed to attain ARARs that apply.	Can be designed to attain ARARs that apply.
Primary Balancing Criteria		
Long-term Effectiveness and Permanence	Removal, treatment and consolidation of contaminant source and contaminated groundwater will reduce risks to potential land users. Institutional controls will further limit risks.	Removal, treatment and consolidation of contaminant source and contaminated groundwater will reduce risks to potential land users. Institutional controls will further limit risks.

TABLE 3 (Continued)
SUMMARY OF EVALUATION OF ALTERNATIVES
PROPOSED REMEDIAL ACTION PLAN, CTO 211
OPERABLE UNIT 2, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Evaluation Criteria	Alternative 6A: GW Extraction, Treatment, Discharge to Slocum Creek with Hot Spot Soil Treatment, Consolidation, and Capping	Alternative 6B: GW Extraction, Pretreatment, Discharge to STP with Hot Spot Soil Treatment, Consolidation, and Capping
Reduction of Toxicity, Mobility, or Volume through Treatment	Active remediation will reduce the volume and toxicity of contaminated groundwater and soil. Soil solidification would reduce contaminant mobility. Residuals created that require disposal.	Active remediation will reduce the volume and toxicity of contaminated groundwater and soil. Soil solidification would reduce contaminant mobility. Residuals created that require disposal.
Short-term Effectiveness	Proper system management will limit short term hazards associated with contaminated media treatment. Possible exposure during "hot spot" excavation, fixation or treatment. Groundwater RGOs achieved in about 60 years. Two to three years to implement.	Proper system management will limit short term hazards associated with contaminated media treatment. Possible exposure during "hot spot" excavation, fixation or treatment. Groundwater RGOs achieved in about 60 years. Two to three years to implement.
Implementability	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.	Alternative consists of common treatment practices, which are readily available/implementable. Monitoring will demonstrate effectiveness.
Costs Capital O&M NPW	 $8,100,000 $385,000 $14,100,000	 $6,000,000 $186,000 $8,900,000
Modifying Criteria		
U.S. EPA/State Acceptance	to be determined	to be determined

TABLE 4
GLOSSARY OF EVALUATION CRITERIA

- **Overall Protection of Human Health and Environment** - Addresses whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- **Compliance with ARAR/TBCs** - Addresses whether or not an alternative will meet all of the applicable or relevant and appropriate requirements (ARARs), other criteria to be considered (TBCs), or other Federal and state environmental statutes and/or provide grounds for invoking a waiver.

- **Long-term Effectiveness and Permanence** - Refers to the magnitude of residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

- **Reduction of Toxicity, Mobility, or Volume through Treatment** - Addresses the anticipated performance of the treatment options that may be employed in an alternative.

- **Short-term Effectiveness** - Refers to the speed with which the alternative achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

- **Implementability** - Addresses the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the chosen solution.

- **Cost** - Includes capital and operation and maintenance costs. For comparative purposes, provides present-worth values.

- **USEPA/State Acceptance** - Evaluates the technical and administrative issues and concerns that the USEPA and the State of North Carolina have regarding each of the alternatives. This criterion is addressed in the ROD once comments on the RI/FS report and the Proposed Plan have been received.

- **Community Acceptance** - Evaluates the issues and concerns the public may have regarding each of the alternatives. This criterion is addressed in the ROD once comments on the RI/FS report and the Proposed Plan have been received.

and capping; and excavation, solidification, thermal desorption, and capping) which would provide even further protection of human health and the environment. However, the additional protection that Alternatives 4, 5, and 6 provide through active soil remediation systems may not be necessary considering the minimal risks associated with soil and groundwater contamination, except under a hypothetical future residential exposure scenario. This scenario is not realistic since the majority of OU2 is a landfill, which would not be suitable for the construction of housing.

Despite the minimal risks associated with the contaminated groundwater under realistic exposure scenarios, institutional controls with monitoring (Alternative 2) will be adequate for protection of human health; however, groundwater would continue to discharge to Turkey Gut and Slocum Creek. Treatment of soil "hot spots" that may contribute to groundwater contamination, will not be necessary to provide adequate protection. The waste buried in the landfill may act as a continuing source of contamination that could not feasibly be removed. No action provides no protection. Therefore, Alternative 1 may be inferior to the other five alternatives, and Alternatives 4, 5, and 6 may overcompensate for the minor risks that exist at the site under realistic exposure scenarios.

Compliance with ARARs

Alternative 1 will not comply with chemical-specific ARARs. Alternative 2 will eventually comply with chemical-specific ARARs through natural attenuation, otherwise a waiver of the state groundwater standards is needed or the surficial aquifer can be reclassified. Alternative 2 does not propose active treatment of the surficial aquifer; therefore, this alternative must comply with the Corrective Action requirements of Chapter 2L of the North Carolina Administrative Code (Section, 106), demonstrating that groundwater restoration using best available technology is not required to provide protection of human health and the environment. Under Alternatives 3, 4, 5, and 6, groundwater contaminants, except for manganese, are expected to meet ARARs in approximately 60 years via active remediation (groundwater extraction and treatment).

Alternative 4, 5, and 6 provide active remediation of soil "hot spots" that exceed RGOs for protection of groundwater. However, waste buried in the landfill would continue to be a potential source of groundwater contamination. The volume of buried waste is substantially greater than the volume of "hot spot" soil.

Alternatives 3, 4, 5, and 6 can be designed to meet all of the location- and action-specific ARARs that apply to them. No location- or action-specific ARARs apply to Alternatives 1 and 2.

Long-Term Effectiveness and Permanence

Although residual risks associated with untreated contaminants will be minimal under realistic exposure scenarios, Alternative 1 is the only alternative that will allow residual risk to remain uncontrolled at OU2. Alternatives 2, 3, 4, 5, and 6 involve continued groundwater monitoring, aquifer-use restrictions, and land-use restrictions, which are all adequate and reliable controls. Alternative 1 involves no controls. As a result, Alternatives 2, 3, 4, 5 and 6 can mitigate the potential for human exposure through the use of institutional controls, while Alternative 1 cannot. Also, the effectiveness of Alternatives 2, 3, 4, 5 and 6 can be determined on a more frequent basis than the effectiveness of Alternative 1.

Under all six alternatives, untreated waste materials (landfill waste) will remain at the site indefinitely; however, at some point in the future, the hazardous constituents are expected to leach out through natural processes. As a result, all six alternatives require 5-year reviews to ensure that adequate protection of human health and the environment is maintained.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 do not involve active groundwater treatment processes to reduce the toxicity, mobility, or volume of the groundwater contaminants. Alternatives 3, 4, 5, and 6, however, involve groundwater extraction and treatment to reduce the toxicity, mobility, or volume of groundwater contaminants.

Alternatives 1, 2, 3, and 5 do not involve active soil treatment processes to reduce the toxicity, mobility, or volume of the soil contaminants. Alternatives 4 and 6, however, involve treatment of soil using air sparging/soil vapor extraction, solidification, and thermal desorption to reduce the toxicity, mobility, or volume of soil contaminants.

Alternatives 3, 4, 5, and 6 satisfy the statutory preference for treatment, There are no treatment residuals associated with Alternatives 1 and 2. Under Alternatives 3, 4, 5, and 6, however, active groundwater treatment processes will create residuals that will require proper disposal.

Short-Term Effectiveness

Alternatives 3, 4, 5, and 6 will create the most risk during implementation. Risks to workers will be increased during the installation of the groundwater extraction system and the installation and operation of the treatment plant. Risks to workers will also be increased during soil excavation, treatment, and handling. Alternative 2 creates some minor risks to workers associated with groundwater and surface water

monitoring. Implementation of Alternative 1 will create no risks to workers. No risks to the community are anticipated for any of the alternatives.

The time in which Alternatives 3, 4, 5, and 6 will achieve the remedial action objectives for groundwater is estimated to be 60 years. More time would be required for natural attenuation to restore the surficial aquifer in Alternatives 1 and 2. The time needed to implement the soil remediation associated with Alternatives 4, 5, and 6 is relatively short compared with the time to remediate groundwater.

Implementability

Alternative 1 is the most implementable. Alternatives 2, 3, 4, 5, and 6 use conventional, well-demonstrated, and commercially available technologies so these alternatives are proven to be implementable and reliable.

Despite its high level of implementability, Alternative 1 does not include adequate monitoring to determine its effectiveness. As a result, there would be a failure to detect potential increases in contaminant levels. Alternatives 2, 3, 4, 5, and 6 involve monitoring plans so potential contaminant increases will be recognized.

Cost

In terms of net present worth (NPW), the no action alternative (Alternative 1) would be the least expensive alternative to implement followed by Alternative 2, 3B, 4B and 5B, 6B, 3A, 4A, and 5A, and 6A. The estimated NPW values in increasing order are $0 (Alternative 1), $549,000 (Alternative 2), $5.2 million (Alternative 3B), $6.0 million (Alternative 4B and 5B), $8.9 million (Alternative 6B), $10.4 million (Alternative 3A), $11.2 million (Alternatives 4A and 5A), and $14.1 million (Alternative 6A).

Summary of the Preferred Remedial Action Alternative

Based on consideration of the requirements of CERCLA, the detailed analysis of potential alternatives using the nine evaluation criteria, and public comments, the DON, USEPA, and NCDEHNR have determined that the preferred remedial alternative for remediation of the soil and groundwater contamination at OU2 is groundwater extraction, pretreatment and discharge to STP with institutional controls (Alternative 3B). The preferred alternative is anticipated to meet the following objectives:

- Prevent potential exposure to buried waste and contaminated soil.
- Prevent exposure to contaminated groundwater in the surficial aquifer.
- Prevent future potential use of contaminated groundwater.

- Prevent migration of contaminated groundwater.

The groundwater extraction system is designed to capture contaminated groundwater migrating from within the landfill, prior to its discharge into Slocum Creek and/or Turkey Gut. It is a containment-type remedy which assumes that the groundwater beneath the entire OU2 landfill area has been adversely affected and requires remediation.

The extraction system consists of 19 wells pumping at an aggregate rate of 123 gpm. Individual well pumping rates vary from 4 to 8 gpm. The wells are placed far enough from Slocum Creek or Turkey Gut to minimize induced infiltration of water from these streams.

Groundwater extraction would continue until the RGOs for each of the contaminants of concern in the surficial aquifer groundwater are achieved. Modeling studies have indicated that this process would take approximately 60 years.

Groundwater pretreatment is designed to reduce concentrations of contaminants present in extracted surficial aquifer groundwater to levels that would be accepted by the MCAS Sewage Treatment Plant (STP).

Pretreatment standards are expected to be enforced for any wastewaters, groundwaters, or stormwaters received by the STP. The sewage treatment facility has sufficient capacity to handle extracted groundwaters from the surficial aquifer beneath OU2. Currently, approximately 2.20 MGD of wastewater is being treated by the STP while its design capacity (average flow rate) is 3.20 MGD. Anticipated loading from extracted shallow groundwater at OU2 is not expected to contribute more than 0.216 MGD of flow to the facility.

The STP consists of the following sequential treatment steps: primary settling, primary biological treatment (trickling filter), secondary biological treatment (activated sludge), secondary clarification, rapid sand filtration, and chlorination/dechlorination. The sludge generated by this facility is disposed of by permitted land application.

Only pH may not meet probable pretreatment standards applicable for discharge of extracted surficial aquifer groundwater to the STP. Although high concentrations of dissolved iron in the extracted groundwater at OU2 have a strong tendency to oxidize to the insoluble state when brought to the surface, it is anticipated that the STP pretreatment standard of 450 mg/L for suspended solids will not be exceeded. Therefore, pretreatment of the extracted groundwater will only require equalization/aeration followed by pH adjustment, with the resultant suspended solids laden groundwater stream being discharged to the primary settling chamber of the STP.

Onsite groundwater pretreatment consists of equalization/aeration and pH adjustment. Extracted groundwaters from 19 wells are pumped first to an equalization/aeration tank, where contaminant surges are dampened and soluble iron is oxidized to the insoluble form. The equalization/aeration tank will be equipped with an automated level control system and two blowers to supply thorough mixing and sufficient air to oxidize iron to the insoluble state.

The effluent from the equalization/aeration tank then proceeds to a flash mix tank, where 50 percent caustic is used to adjust the pH to meet discharge requirements and supply hydroxide ion for the formation of insoluble iron. The flash mix tank will be equipped with a top-mounted turbine-type mixer for blending, and an automated pH control system.

Fifty percent caustic will be used to maintain a pH between 7.0 and 7.5 to ensure that stream discharge requirements for pH (6.8 to 8.5) are met. The discharge from the flash mix tank is then pumped to the primary settling chamber in the STP for further treatment prior to discharge to the Neuse River.

It is proposed that the pretreatment facility, consisting of the equalization/aeration tank, the flash mix tank, chemical storage tank, and accessories, be placed in a newly constructed treatment building located to the south of the unlined ponds between the existing fence and the former sludge application area. A site layout map for Alternative 3B and a conceptual process flow diagram for the groundwater pretreatment and discharge component for this alternative are shown in Figures 5 and 6, respectively.

Institutional controls would consist of maintaining records of the contamination at OU2 in the MCAS Cherry Point Master Plan and designating the area as a restricted or limited use area. Also, monitoring of groundwater and surface waters to assess the migration of contaminants and to determine the need for future actions would be conducted. Additionally, this alternative includes reinforcement and repair of fencing and warning signs.

The Master Plan records on the presence of contamination at the site would ensure that at the time of future land development, the Air Station would be able to take adequate measures to minimize adverse human health and environmental effects. The area would be given a designation in the Master Plan that would prohibit residential use, invasive construction activities, and installation of wells.

Monitoring would consist of annual sampling and analysis of surficial and Yorktown aquifer monitoring wells and surface waters in Slocum Creek and Turkey Gut to assess the migration of contaminants from OU2 into the environment.

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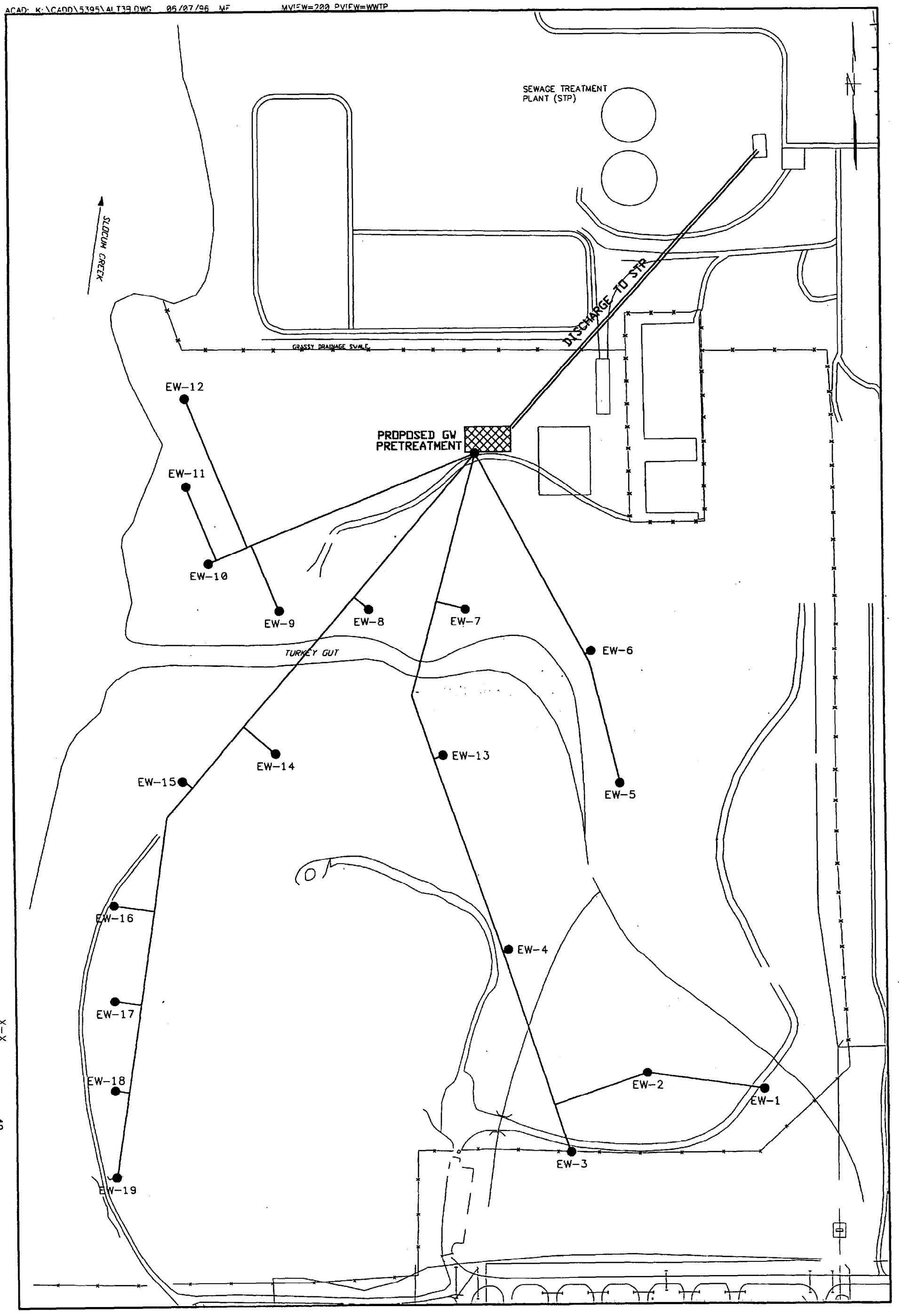

LEGEND

EW-10 GROUNDWATER EXTRACTION WELL

GROUNDWATER TREATMENT PLANT

OU2 SITE LAYOUT ALTERNATIVE 3B MCAS CHERRY POINT, NC

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SCALE IN FEET

FIGURE 5

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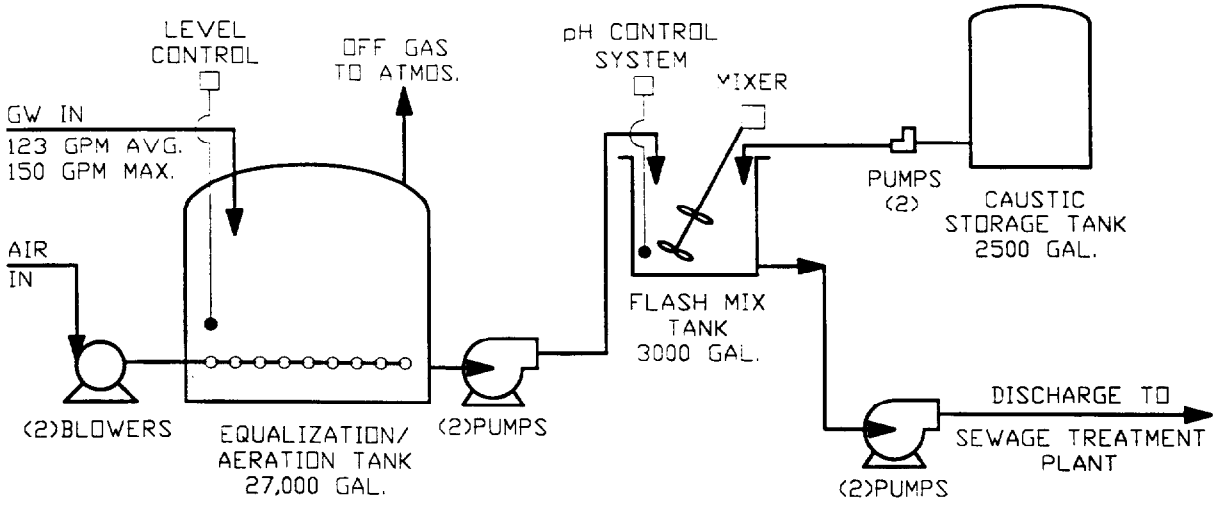

GROUNDWATER PRETREATMENT SYSTEM
OPERABLE UNIT 2
MCAS CHERRY POINT, NC

FIGURE 6

Brown & Root Environmental

Fencing and signs would be replaced and repaired as necessary to physically limit access to the site. Signs are typically posted at equal intervals along the perimeter of the site and along roads leading to the site. A chain-link fence approximately 8 feet high currently surrounds most of the site to limit access. The two unlined ponds at the north end of OU2, which until recently served as aeration basins for the STP, would also be enclosed by fencing now that they are no longer in use. Locked gates would be maintained at the entrance of each roadway to the site. It is estimated that about 1,400 feet of chain-link fence would be required to encompass the perimeter of the two ponds.

Every 5 years, a site review would be conducted to evaluate the site status and determine whether further action is necessary. The site review is required because this alternative allows contaminants to remain on site at levels that exceed RGOs. Figure 7 depicts the process block flow diagram for this alternative.

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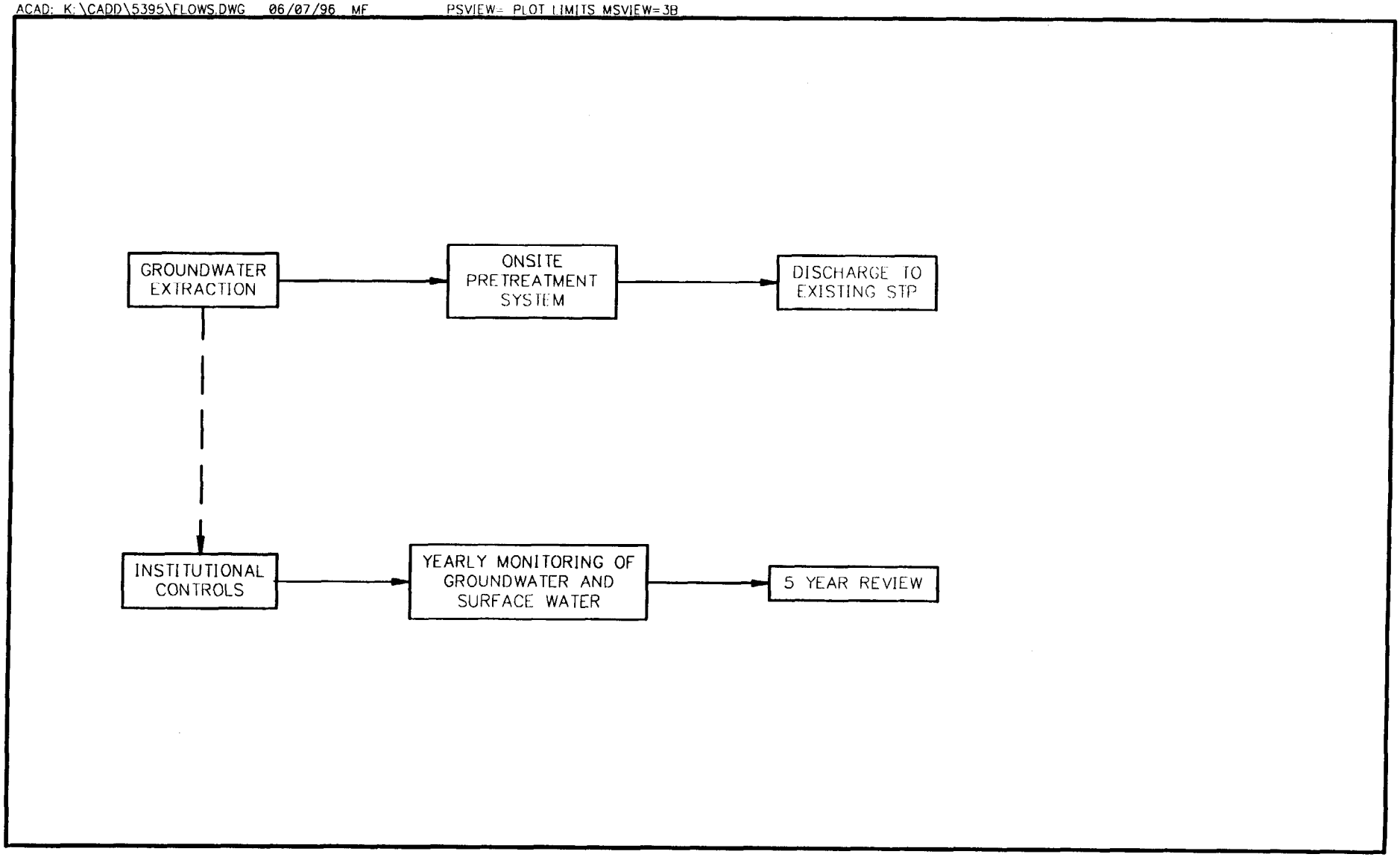

ALTERNATIVE 3B
CONCEPTUAL BLOCK FLOW DIAGRAM
OPERABLE UNIT 2
MCAS CHERRY POINT, NC

FIGURE 7

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COMMUNITY PARTICIPATION

A critical part of the selection of a remedial action alternative is community involvement. The following information is provided to solicit community input into the selection of a remedy for OU2 (Sites 10, 44A, 46, and 76).

Public Comment Period

The public comment period for the PRAP for OU2 will begin on Tuesday, July 30, 1996 and will end 30 calendar days from that date. Written comments should be sent to the following address:

Mr. Lance Laughmiller
Remedial Project Manager
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, Virginia 23511-2699
(804) 322-4811

or

Joint Public Affairs Officer
Marine Corps Air Station
Cherry Point, North Carolina 28533-0013
(919) 466-2536/4241

A public meeting will be held at the where in city/location on Monday, August 12, 1996 at time. Representatives of the Navy, the Air Station, and their consultants, will be available at the meeting to answer questions and accept public comments on the Proposed Plan or remedy for OU2. In addition, an overview of the site characterization will be presented.

Meeting minutes will be made available to the public through the information repositories at the libraries listed below. A responsiveness summary will be prepared at the conclusion of the comment period to summarize significant comments, criticisms, and new relevant information submitted to MCAS Cherry Point and the Navy during the comment period. In addition, the summary will include the responses to each issue/question raised at the public meeting. After the Record of Decision (ROD) is signed, MCAS Cherry Point and the Navy will publish a notice of availability of the ROD (including the responsiveness summary) in the list newspapers and place a copy of the ROD in each information repository.

Information Repositories

A collection of general information, including the administrative record file, is available to the community in the information repositories located at the following locations:

MCAS Cherry Point Library
Marine Corps Air Station
PSC Box 8019
Cherry Point, North Carolina 28533-0019
(919) 466-3552

Hours:
Monday - Thursday 9:00 a.m.-9:45 p.m.
Friday: 9:00 a.m.-5:45 p.m.
Saturday: 10:00 a.m.-3:45 p.m.
Sunday: 1:00 p.m.-8:45 p.m.

Havelock Public Library
300 Miller Boulevard
Havelock, North Carolina 28532
(919) 447-7509

Hours:
Monday to Friday: 10:00 a.m.-8:00 p.m.
Saturday: 10:00 a.m.-1:00 p.m.
Sunday: Closed

**IF YOU HAVE ANY QUESTIONS ABOUT OU2
PLEASE CONTACT ONE OF THE FOLLOWING:**

Environmental Affairs Department
Marine Corps Air Station PSC Code 8006
Cherry Point, North Carolina 28533-0006
Attention: Ms. Renee Henderson
(919) 466-5391

Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street (Building N-26)
Norfolk, Virginia 23511-2699
Attention: Mr. Lance Laughmiller, Code 1823
(804) 322-4811

U.S. EPA, Region IV
Waste Management Division
345 Courtland Street, NE
Atlanta, Georgia
Attention: Ms. Gena Townsend
(404) 347-3555 (ext. 6459)

NC Department of Environmental Health and Natural Resources
Superfund Section
Suite 150
401 Oberlin Road
Raleigh, North Carolina 27605
Attention: Ms. Linda Raynor
(919) 733-2801 (ext. 340)

Joint Public Affairs Office
Marine Corps Air Station
Cherry Point, North Carolina 28533-0013
(919) 466-2536/4241

MAILING LIST

If you are not on the mailing list and would like to receive future publications pertaining to OU2 as they become available please call or complete, detach, and mail a copy of this form to the point of contact listed below.

Public Affairs Officer
Joint Public Affairs Office
Marine Corps Air Station
Cherry Point, North Carolina 28533-0013

Name _____

Address _____

_____

Affiliation _____

Phone ( ) _____